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THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

110th Session.] FRIDAY, NOVEMBER 11, 1864. [No. 625. Vol. XII.

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Announcements by the Council.

Notice to Members.

The One Hundred and Eleventh Session of the Society will commence on Wednesday, the 16th instant, when the Opening Address will be delivered by Wm. Hawes, Esq., F.G.S., Chairman of the Council.

On Wednesday, the 23rd instant, a Paper by Wm. Fairbairn, Esq., LL.D., F.R.S., "On the Application of Iron to the Purposes of War and Naval Architecture," will be read.

The Chair is taken at Eight o'clock.

There will be three Courses of "Cantor" Lectures on the following subjects during the ensuing Session:—

"On the Relation of Science and Art to Manufactures." By B. Waterhouse Hawkins, Esq., F.G.S.

"On the Application of Geology to the Arts and Manufactures." By Professor D. T. Ansted, M.A., F.R.S.

"On the Application of Chemistry to the Arts." By Dr. F. Crace Calvert, F.R.S.

Mr. B. Waterhouse Hawkins will commence his course on Monday evening, the 12th of December.

These Lectures are open to Members free of charge, and a Member has the privilege of introducing ONE Friend to each Lecture. Particulars of the Courses will be duly announced in the *Journal.*

A List of Members of the Society is issued with this day's *Journal,* in a form suitable for binding with the volume.

ON THE PREPARATION OF FUEL FROM MEGASS.

By Henry Mitchell, Esq., M.D. (of Trinidad.)

It is almost unnecessary to inform those interested in colonial property that the stalks of the sugar-cane, or megass as they are usually termed, form the principal, and in many cases the sole material used as fuel for evaporating cane-juice in the manufacture of sugar. On their supply, therefore, in sufficient quantity, and of suitable quality, depends much of the planters' success in harvest; and dry megass thus becomes a very important element in preparing for market one of the necessaries of life.

But to obtain this indispensable article is a labour attended by many counterbalancing drawbacks, as may be seen by following the megass in its passage from the mill to the furnace. The canes, on leaving the former, have had their juice more or less fully expressed by the rollers, and the crushed stalks are either removed by hand or carried off on endless webs to large sheds, or *logies,* where they are packed for storage till such time as they appear dry enough to serve as fuel. As the solid refuse of the cane is bulky, the logies for its reception must be proportionately spacious, and accordingly on large estates they cost from £1,000 to £1,500. Under the actual system of manufacture they are indispensable, but their presence, stored with a highly combustible material, is a source of continued uneasiness to the proprietor. A spark from one of the chimnies, or from the pipe of a careless smoker, may set any of the logies in a blaze, and involve the whole sugar works in one destructive conflagration. Even when the fire is confined to the logie and the logie itself insured, the non-insured megass fuel is consumed, and the general result is that the manufacture of sugar is arrested or conducted under heavy disadvantages. The megass logies are exposed to other and more destructive influences, at the hands of incendiaries.

The expense which accompanies the present use of megass as a fuel does not end with its storing in the logie, as on an average only from 65 to 75 per cent. of juice is extracted from the cane by the mill, and as the ripe cane is known to consist of ten per cent. of woody fibre and ninety per cent. of juice, it follows that nearly thirty-five per cent. of weight remains in the megass; this, if immediately dried, would furnish as fuel not only its ten per cent. of woody fibre, but an additional five per cent.

of sugar, an exceedingly good, although somewhat expensive combustible. The available material for the furnaces would thus be increased fifty per cent., and be more than sufficient for all evaporating purposes required on a sugar estate. But this unfortunately is not the course pursued at present. The cane stalks, soaking in their residuary sweets, are consigned in a mass to the logie where, under the influence of heat and moisture, an active fermentation immediately commences, and their constituents are replaced by equivalents of acetic acid and water, which are not only incombustible themselves, but impede the combustion of the woody fibre till such time as they are dried out before or after being thrown into the hopper, entailing in the one case loss of labour, and in the other loss of heat already generated. There thus takes place in the logie a direct loss of thirty-three per cent. of the fuel consigned to it, while the remainder lies soddening in its own moisture, and solidifying by its own weight till dug out for transport to the furnace. Even here the expense and inconvenience attending the present mode of using megass as a fuel do not end; to insure its quality it should be spread out in thin layers to the sun and wind, after which it must be gathered up again and carried to the furnace hopper.

The expense involved in manual labour alone, connected with the present treatment of megass as a fuel, is enormous, and requires separate mention. On a well-conducted property (without mechanical assistance) five hands per day per hogshead of sugar made, were absorbed in the transfer and distribution of the crushed cane, and about as many more in spreading it out to sun and wind when damp, as it usually is in this climate. Leaving altogether out of consideration the last-mentioned class, and supposing the megass to be uniformly dry when taken from the logie to the furnace, it will not be difficult to estimate the saving in labour which would thus be effected, say in Trinidad. Take the crop at 40,000 hhds., which it has averaged for some years; this is usually made in 100 days, or at the rate of 400 hhds. per day; this at 5 hands per hhd. is equivalent to a demand for 2,000 hands during crop. To save these 2,000 hands in a country supplied with labour from India and China, at the rate of £21 per head, is equal to a money saving of £42,000, not once in a way but permanently, while sugar-making is continued. The saving of labour to Cuba or Demerara would of course be proportioned to their larger crops. This saving may be described in another form, viz., without any increase in the number of immigrants imported, 2,000 hands would be liberated from an employment no longer necessary, and made available for carting out manure, weeding young canes, and other agricultural operations of paramount importance, which are now from dearth of labour almost or entirely neglected, to the great injury of the ensuing crop.

The evils arising from the use of damp fuel are not limited to points of plantation economy; they extend much further and involve the social well-being of the colonies more than is usually supposed. Damp fuel protracts the hours of labour at the sugar-works from 15 to 18 or 20 hours, sometimes even longer, and the estate labourers, though fond of the crop season and its indulgencies, though willing and enduring to a degree unsurpassed elsewhere, become fagged and disgusted. The appetite for ardent spirits, rarely dormant, is whetted and too freely indulged, while the promiscuous employment of the sexes in protracted night work leads to an amount of social demoralisation which no preventive or remedial steps can reach, and which must tell sadly against the industrial and moral future of both the peasantry and their employers. Night work was the distinctive and most abhorrent feature of slavery, and its abuses, patent to every disinterested eye, led more directly to emancipation than the unseen horrors of the middle passage.

Having thus, as shortly as was compatible with the importance of the matter, pointed out the cumbrous insecurity of the megass logie system, the absolute waste of nearly 33 per cent. of the fuel consigned to the logie, the expenses, not merely of construction, but of hand labour entailed by its maintenance, and, though last not least, the social degradation with which it has hitherto leavened and contaminated those exposed to its influence, it is time to say a few words on an arrangement which, in all probability, must soon displace it. An apparatus has been invented by Mr. H. Warner, called a "megassiccator," which is a machine for rapidly drying the crushed cane stalks; it is simply a chamber of iron or other convenient material, traversed by a series of endless metallic webs, on which the megass travels for a longer or shorter period exposed to a current of heated air till it falls out at the lower end as dry as tinder. The chamber is of size proportioned to the power of the mill to which it is adapted, and is so placed as to receive the crushed canes directly from the mill roller on one extremity of the first or highest of the endless metallic webs. The webs are in three or four tiers superposed horizontally one over the other. The megass travels along the first tier of metallic webbing till it falls on the second one, moving in a contrary direction, and placed about three feet lower, along which it returns to drop on the third, and so on till it finally reaches the furnace hopper. As this arrangement is automatic, none of the hands employed in the old system are required.

The megass as it travels along the chamber on the metallic web encounters a current of heated air, driven in an ascending or descending direction as the case may be. This heated air is taken by a fanner from the products of combustion as they pass along from the sugar boilers to the chimney. Its amount is regulated according to the size and speed of the fanner, which last, in common with the metallic webbing, is driven by a small engine quite unconnected with the cane mill, experience having shown this to be requisite. The heated draught may be cooled down by an admixture of cold air to any degree as it leaves the fanner, and this obviates the least chance of the megass being inflamed in the apparatus. Of this, however, there is no real danger at any time, because when the waste heat is received from a multitubular boiler it has been already pretty well exhausted, say to 400° Farenheit, and becomes still further lowered before reaching the fanner. In the experimental trials of the megassiccator, which were conducted on a working scale, the fanner, which was six feet in diameter, with eight curved blades, never attained a speed over 250 revolutions. The webs were 6 feet wide, the two upper tiers 19 feet, and the third 23 feet long, in all about 60 feet, and as they travelled at the rate of from 5 to 7 inches per minute the megass consequently took from $1\frac{3}{4}$ to $2\frac{1}{4}$ hours to dry; the trials, which were repeated at intervals during the season, while satisfactory as to the principles involved, afforded ample opportunity for noting such modifications as might be useful in practice.

The heated air from ordinary sugar pans, where a multitubular boiler is not used, ascends the chimney at a temperature of about 700°. If then it should be considered desirable to employ it without much dilution, the fanner must be so arranged as to drive the heated draught downwards through the chamber, and thus bring the heated air first in contact with the megass wet as it leaves the mill, in which state it is so uninflammable that it will immediately deaden and ultimately extinguish the fire, if introduced into the most energetically-acting furnace: excess of moisture will thus be opposed to excess of heat, and all danger of fire avoided; as a further precaution a jet of steam may be made to enter the chamber either continuously with the heated draught, or when thought necessary by the attendant. To prevent the injurious action of extreme heat on the vanes of the fanner, such as occasionally occurs to dampers, it is necessary in hanging the former to make provision for admitting sufficient air from without, or the fanner may be so placed as to draw the products of combustion through the chamber instead of forcing them through. These details, however, are unnecessary in the present general description.

The donkey-engine used in the trial workings was a 3-horse power, and inadequate to drive the fanner, and at the same time enable the web to carry away all the crushed canes from a mill which was grinding nearly 4 hhds. per day; the web received, however, two-thirds of the megass, which was thoroughly dried with the fanner speed already mentioned, and at a temperature in the chamber which never exceeded that of the surrounding atmosphere by 100°. This low temperature requires a word of explanation; although the draught left the multitubular at a temperature varying from 400° to 450°, it was cooled down to 180° F. as it passed the fanner, by the action of a damper so hung as to abstract more or less the heated air while it admitted the cold. This precaution, which was adopted to avoid all danger from fire, was carried unnecessarily far, but established unequivocally that a very moderate temperature could, with an increased speed of fanner and an accelerated movement of the webs, dry the whole megass. This last observation is important, as it proves that in practice the megassiccator may be successfully worked even when much of the heat otherwise lost has been already utilised by the employment of multitubular boilers, while by its adoption the disadvantages of the common boiler system will be compensated by a supply of good fuel more than adequate for all requirements.

It is noteworthy that the effect of flame from megass, which has been dried without losing its residuary sweets, is not limited to the apparent theoretical results of the combustion of the 10 lbs. of woody fibre + 5 lbs. of sugar it contains. Coal as a fuel is twice as powerful, weight for weight, as woody fibre and sugar, but in daily practice it is found that for an equal area of grating bar surface good megass far surpasses coal in speediness of action and intensity of result, whether for evaporation from the range of sugar pans, or raising steam in boilers. With good dry megass a square foot of grating bar will often evaporate 200 lbs. of water per hour. This subject has never been practically examined, although as far back as 1782 Casaux remarked, that "as applied to sugar pans the long lambent flame from dry megass was decidedly superior to that from any other fuel." The intensity of the volume of flame produced by good dry megass is probably due to the fact that the loosely aggregated tissue of this fuel when used alone completely fills up the furnace chamber, so that it burns without the flame being diluted by much more air than is required for combustion, and this is shown by Rankine (see his work on "The Steam engine and other prime movers," p. 284) to make a difference in some cases of 2,000° F. in the temperature of the flame.

The intensity of the heat thus furnished by the increased quantity and superior quality of the fuel dried by the megassiccator is accompanied by great primary economy in the original erection of the sugar works, which, although it comes late into the field, will be duly appreciated by those who raise chimnies in these regions of earthquakes and hurricanes. A set of works calculated to boil off 600 hhds of sugar requires a stalk over 100 feet high, which, with its appliances, will cost at least £1,000, its draught will be at the outside 1 lb. to the square foot, while a megassiccator for an estate of the same scale, of the best material and workmanship will cost less, and not only furnish a draught equal to a chimney *one thousand* feet high, but dispense altogether with the use of such a stalk and the expense of its erection. The results obtained from the fanner in the working trials were quite in accordance with the views of Prideaux, as laid down in his valuable treatise on fuel. While the fanner revolved at the moderate speed already mentioned, and diverted the heated draught from the chimney, the contents of the sugar pans boiled fiercely, but when the fanner ceased playing and the draught returned to the chimney, the syrup subsided to a sluggish simmer. The chimney showed a direct disadvantage compared to the mechanical draught. Should any doubt remain on this point it will be dissipated by reference to an experiment by the Nestor of flues (see Williams on "The combustion of coal and prevention of smoke," Weale's edition, page 179), who states that he obtained not only 240° more heat, but saved 28° per cent. fuel by substituting fanner action for the ordinary chimney draught.

To resume briefly the advantages of the megassiccator, as contrasted with the ordinary mode: it presents simplicity of construction, facility of erection, durability of material, united in a mechanism independent of the general motor power, automatic, self-contained, scarcely admitting of derangement, requiring but the space of an ordinary boiler, and entirely excluding the risks arising from accidental or wilful firing of megass logies. Under its influence the question of fuel on sugar estates assumes a novel aspect. No longer scant and of bad or unequal value, the megass increases 50 per cent. by the operation of drying, or rather 50 per cent. is saved which would be otherwise lost by fermentation. This abundant supply of fuel used in the manner indicated, under circumstances the most favourable for combustion, is of necessity accompanied by speedier evaporation, and this, in its turn, by earlier closing hours; the work of the boiling house following fast on that of the mill, the daily labours of a sugar estate may close with sun-down; and though last, not least in point of economy, as the quantity of fuel prepared is in excess of all requirements, there will be no occasion, with the mere view of economising fuel, to substitute multitubular boilers where they do not already exist for those of ordinary construction.

The megassiccator is certainly a great improvement on the present faulty system. The time will, however, assuredly come when the principles of a juster economy, correctly reduced to practice, will enable the planter to extract all the sugar from the cane, and to return the residue to the soil as manure, or convert it into paper, for which it is well adapted, not only by texture but by quantity, the weight of the cane-stalks annually consumed as fuel in the West Indies alone being somewhat over a million tons, for the ten per cent. of woody fibre in the cane is considerably heavier than the sugar it yields. The cane-stalk also possesses this marked advantage over the bamboo, and most other textile plants extensively used in paper-making, viz., that when divested of its external covering, and thoroughly washed, the fibrous pulp remains of dazzling whiteness.

THE NORTH LONDON WORKING CLASSES' INDUSTRIAL EXHIBITION.

The exhibition which has been held at the Agricultural Hall during the last three weeks, was formally closed, with some ceremony, by the Right Hon. W. E. Gladstone, Chancellor of the Exchequer, on Monday evening, the 7th of November.

The ceremony was similar in character to that observed at the opening, when Earl Russell presided. Shortly after seven o'clock in the evening the Right Hon. W. E. Gladstone, accompanied by Mr. Arthur Kinnaird, M.P., and Mr. Samuel Morley, was escorted to the chair on the platform by the members of the committee. The choir, numbering several hundred voices, then sang the Hundredth Psalm.

Mr. W. J. Watts, the secretary, then read the report, which, after acknowledging thankfully the guidance of the efforts of the committee by the Giver of All Good, stated it was originally intended to close the exhibition on the 21st October, but representations were made which induced the committee to extend the time by one week, and they were the more easily enabled to do this through the liberal manner in which the directors of the hall had met them. Although there had been a very general request that the prices of admission should be increased, the committee felt bound not to change them during the time for which it had been originally announced they would be charged; but when it was determined to keep the Exhibition open for an additional week the committee fixed the charge for admission at 6d. The number of persons who had visited the Exhibition was as follows:—On the 17th October, 4,860; the 18th, 10,233; the 19th, 16,350; the 20th, 10,820; the 21st, 8,300; the 22nd, 11,849; the 24th, 17,635; the 25th, 17,000; the 26th, 16,000; the 27th, 22,000; the 28th, 12,242; the 29th, 14,932; the 31st, 7,600; the 2nd November, 7,000; the 3rd, 5,000; the 4th, 4,413; the 5th, 4,090; making a total of 196,926 persons. Notwithstanding the largeness of the attendance only six policemen had been engaged in the building, and there had not been a single case of wilful damage or loss, but a few glasses had been accidentally broken. The prizes awarded by the adjudicators numbered 336—first class, 81, and the second class, 76; honourable mention, 179; in addition to which 10 special prizes were awarded. The prizes would consist of a certificate, which in itself would be a work of art of considerable merit, in the Italian style. In the centre there would be a photographic view of the exhibition, supported by figures of Strength and Beauty and Labour and Taste; Fame and Fortune would be at the base, and between them a medal representing the Genius of the Exhibition. On shields would be a record of the opening of the Exhibition by Earl Russell, the closing by the Right Hon. W. E. Gladstone, and the presentation of the prizes by the Earl of Shaftesbury, which would take place in January at Exeter Hall. As a memorial of the exhibition, the report also stated that an illustrated catalogue would be published.

Dr. Wesley's Ode, composed for the opening of the exhibition, the words by W. H. Bellamy, Esq., was sung by Madame Louisa Vinning, Miss Susan Pyne, Miss Leffler, and Mr. Lewis Thomas.

The right hon. chairman was then conducted round the exhibition, Dr. S. S. Wesley performing on the organ in the meantime.

On the chairman's return to the platform the Rev. T. W. Fowle, M.A., of Holy Trinity, Hoxton, offered a prayer.

The choir having sung the "Hallelujah Chorus,"

Mr. Gladstone addressed the meeting at considerable length, and declared the exhibition closed, and the proceedings terminated with a vote of thanks to the chairman, proposed by Mr. Samuel Morley and the Hon. A. Kinnaird, M.P., followed by "God save the Queen."

Proceedings of Institutions.

GLASGOW ATHENÆUM.—The certificates awarded by the Society of Arts to the students of the Athenæum, and the prizes offered by the late Hugh Tennent, Esq., to the most successful students, were distributed on Tuesday week, at a public meeting held in the Lower Hall of the Institution. The Hon. the Lord Provost presided, and around him were W. West Watson, Esq., City Chamberlain; Councillor Neilson; M. Provan, Esq.; Dr. Pritchard; J. G. M'Gill, Esq., Chairman of the Board of Directors; Robert Allan, Esq.; A. H. M'Lean, Esq., and other members of the Local Board of Examiners. Proceedings were opened by the chairman calling on Mr. Provan to read the report of the Local Board of Examiners, which stated that the number of students examined by the Local Board this year at the sifting examination was 52, being an increase of five above last year, of whom 50 passed and two were rejected. Of these 42 presented themselves at the Annual Examination, and 38 obtained certificates, four being unsuccessful. Fifty papers were worked and 45 certificates granted, viz., 19 first class, 17 second class, and nine third class. There were in all seven prizes awarded, of which four were second prizes, two first prizes, and the prize given by the late Prince Consort, being 25 guineas, and the highest certificate in the gift of the Society, which was publicly presented to Mr. John Allan, the successful competitor, by the Prince of Wales. The students, four in number, who gained the prizes, viz., Messrs. Alexander Johnston, James Wade, James Dougall Borthwick, and John Allan, were each entitled to £5, given by the late Hugh Tennent, Esq., whose loss was deeply felt by the Institution, he having, by stimulating the efforts of the Athenæum students, aided largely in enabling them to attain the distinguished place which they held in these Examinations. The Lord Provost then distributed the certificates, and gave away the money prizes left by Mr. Tennent. In addressing the meeting, the Lord Provost said that he had very much pleasure in being present, and having the honour of presenting these certificates. It was a very happy idea of the Society of Arts—the institution of these prizes and certificates for competitive Examinations. That Society was in a position to stimulate the attention of young men attending the various classes of this and similar Institutes in a way that could not well, perhaps, otherwise have been done. Although one of these certificates might not have very much value in the eyes of some, yet they were of much value to the young men themselves, in having stimulated them to take the position in these classes they had taken, and would prove of peculiar value in their future life, as they would show that, at an early stage of their career, they took a high possition in the various subjects of their study. Of those who were not successful in getting these certificates, but who might very nearly have acquired one of them, it could be said that they had not been altogether unrewarded, for undoubtedly they had given closer attention to the various departments of study to which they had addressed themselves than they would otherwise have done. He had to-night given away sums of money which had been left by one of their townsmen, who took a very great interest in most things connected with the good of the city, and especially with the education of the young. Mr. Tennent had for a long time given special attention to the classes connected with the Athenæum, and for many years he had taken an interest in students progressing through the University, chiefly with a view of following out studies in divinity. He maintained for these young men teachers in elocution, and teachers in some other of the subordinate departments, stimulating their attention by prizes. Several of these he had made permanent by bequest or gift, made some years before his death. He had made provision for a portion of these in the case of other Institutions, but his being cut off so suddenly had, perhaps, prevented that provision for this Institution which there is little doubt he contemplated. The city of Glasgow had lost in him an estimable citizen, and many Institutions, to which he had contributed, a valuable friend. He rejoiced, in looking over the report of the Society of Arts of last year, to observe the position that this Institution had taken. Looking at the number of students who went forward from the Athenæum, this Institution had attained a larger proportionate number of prizes and first-class certificates than any other Institution in Great Britain. Mr. John Allan (Prince Consort's prizeman) moved a vote of thanks to be given to the members of the Local Board of Examiners. In briefly moving this vote, he made a special reference to the labours of the secretary, Mr. Provan. The meeting warmly supported the motion, to which Mr. Pritchard replied. Mr. M'Gill having moved a vote of thanks to the Lord Provost for presiding on the occasion, the proceedings terminated.

Manufactures.

MINIUM OF IRON.—The society called the *Académie Nationale*, of Paris, has awarded a medal to M. de Cartier for his preparation of *Minium de fer d'Anderghem*—the name of the place of manufacture in Belgium. The *Société d'Encouragement* and the *Société Centrale des Architectes*, also of Paris, have likewise reported favourably on the product. The minium of iron is said to answer all the purposes of white lead, and other preparations of the like kind for painting, and to possess more solidity, to be cheaper, to last longer, and to have an especial value in preserving iron from oxidation, and rendering the surface of wood hard. Remarkable freedom from acid or adulteration is claimed for M. de Cartier's product, which is also said to lie on iron surfaces evenly and smooth like a varnish, effectually excluding air. It is in use on the Belgian railways and steam boats, and also in the army and the prisons; and it is recommended for dressing canvass for awnings, tarpaulings, and other protecting sheets. It works with linseed boiled oil, like any other pigment, or with cold oil with a little dryer such as litharge, but not turpentine; but for painting iron, to be exposed to sea water, litharge must not be used. It must be mentioned, however, that it is of a dark brown colour, but its tone may be changed by the addition of black, yellow, or green. Its durability is said to be two or three times greater than that of white lead. It will bear a great amount of heat, and, mixed with tar, forms an excellent pigment for boats, hardening the wood in a remarkable manner. When mixed with oil it does not separate again like whitelead, or become clotted. The following are the proportions given for its use: a kilogramme of minium, with $1\frac{1}{4}$ kil. of oil, and $\frac{1}{20}$ kil. of drier.

Colonies.

LABOUR MARKET, MELBOURNE.—The cold inclement weather (August, 1864) has prevented farming operations and caused an almost cessation of demand for that description of labour. Married couples unencumbered with young children are in moderately fair demand at steady rates of wages. Thoroughly competent servants, enabled to give good references, are in steady request, but young women unused to household work, or suited only for farm work, are numerously unemployed, and find difficulty in procuring situations. Male domestics of all kinds are comparatively in little or no request. Rates of wages are, however:—Married couples, £50 to £70; female cooks, £40 to £52; housemaids and laundresses, from £25 to £30; nurserymaids, from £16 to £18 per annum; men cooks for hotels, £55 to £60; ploughmen, £40; grooms and coachmen, from £40 to £60 per annum; gardeners, 25s. per week.

Notes.

PROPOSED INDUSTRIAL EXHIBITION IN MARYLEBONE.—The All Souls (St. Marylebone) Club stands forth as one of the greatest successes yet achieved in this movement, and as pointing out how, in connection with it, the co-operative principle may be introduced with advantage. It started at the commencement of the year on a basis of non-sectarianism and perfect equality, twopence per week and no entrance fee conferring the use of two bagatelle rooms with three boards, a suite of rooms for reading, chess, draughts, &c., over a pipe, and a suite ditto for the non-smokers, a large room at back where elocution, singing, and other classes are held and concerts given. A co-operative store has been started, and the report of the committtee shows a profit of 19 per cent. on the first month's working. The members can also obtain good and cheap coals by co-operation, a coal club being in action on the premises. The committee now invite the working men of Marylebone to join in holding a working-classes industrial exhibition at Christmas time in the school-room of Great Portland-street, where a public meeting will shortly be held on the subject, with Mr. Peter Graham as chairman.

EXHIBITION AT COPENHAGEN.—There has for some time been a strong desire that there should be a general exhibition of the manufactures and works of art of all the Scandinavian States, and that it should be held in Copenhagen, in the same way that exhibitions of the same kind, which were first held in London, have since taken place in Paris and elsewhere. A committee for carrying the wishes that had been expressed on this subject was therefore some time ago appointed, of which his Royal Highness Prince Oscar was selected to be the president, and the report has just been published, in which it proposed "That an exhibition of the products of the three Scandinavian States—Sweden, Norway, and Denmark—should take place in the summer of 1866, and that for that purpose a crystal palace should be constructed at the expense of the state and of the capital."

CRYSTAL PALACE IN HOLLAND.—A Crystal Palace has been opened at Amsterdam with great solemnity, and in the presence of inhabitants from all parts of Holland. The model of Sir Joseph Paxton's structure of 1851 has been adopted with much success, and the structure offers a remarkable contrast to most of the public and private buildings in the capital. The project was started as long ago as 1853, but in consequence of all kinds of hindrances being offered, the building was not commenced till 1858, and since then many circumstances have combined to prevent its completion; but the projector, Dr. Sarpathi, has at last experienced the satisfaction of seeing the building finished and opened with an exhibition of art and industry. The patron of the undertaking, Prince Frederick, uncle of the King, presided at the ceremony, and replied in a most gratifying manner to an address from Dr. Sarpathi, whom the Prince decorated with the Order of the Lion of the Netherlands.

THE RAILWAY TUNNEL UNDER THE APPENINES.—The tunnel under the Appenines, on the Bologna and Florence line, has just been opened to the public. Travellers may now proceed from Turin and Milan to Rome and Naples without any other interruption on the railway than the few miles which separate Civita Vecchia from Orbitello, on the Tuscan coast.

Correspondence.

DWELLINGS OF THE LABOURING CLASSES.—SIR,—The continued ventilation of that important question—the house accommodation of the labouring class (and more particularly of that portion of the body employed in agriculture)—cannot but prove of great benefit, for it is one of those circumstances which, sanctioned by long usage, has become strengthened by time, till the mind has become so accustomed to it as to turn with repugnance from any alteration. I do not mean to say that there is at the present time any aversion to considering the subject, for it is manifestly admitted on all hands, and on every possible occasion, to be one of the crying subjects of the day. But I do submit that the question is not generally viewed in that light which common sense would direct us to look at it. That it is impossible to carry out the improvement of the dwellings of the labouring class, as a mere act of charity, is plain without further proof. That by such means the benevolent views of individuals may be carried out is admitted, and much and sincere praise is due for such attempts—but through the length and breadth of the land this would be futile and inefficient. So, likewise, to open the door for greater publicity for speculative builders in this matter, would only aggravate the mischief, by rendering that more easy which has already produced misery and degradation enough, in unfit and imperfect dwellings. But common sense will teach us that, in order to make such a movement as we desire lasting and universal, the sympathies and desires of the class must be excited to further it. That to have men and families appreciate the blessings of decent Christian homes, they must learn to practise those qualities which give warmth and cheerfulness to the domestic hearth—the qualities of temperance, free-thought, and self-respect. Without these it may be asserted that the poor man, were he placed in a palace, would find no home. It is with the view, therefore, of thus bringing the action of the labouring class into this question that I argue in favour of the adoption of any system which would give stimulus to the production of such qualities as I have enumerated before, and which will fit the poor man for a home where they might be called into exercise; and this system, I humbly think, may be found in co-operative action, of which we have lately heard so much; and I sincerely believe that by giving every encouragement in our power, as individuals, to a plan which has in many instances worked so much substantial good among the poor, that we shall generate mong them feelings which will make them appreciate more decent dwellings, and those which more befit a Christian country, than the loathsome dens in which they are now often found. Thus will their sympathies be enlisted in favour of the movement, and the end of it, viz., the improvement of the classes, be effected by the very means intended—their having, or trying to have, better dwellings.—I am, &c., J. BANKS ROBINSON.

Melford, Sudbury, October 29, 1864.

MEETINGS FOR THE ENSUING WEEK.

MON. ...R. Geographical, 8½. 1. President's Address. 2. Captain R. F. Burton, "On the Present State of our Knowledge with regard to the Source of the Nile. 3. The late Richard Thornton, "Journey to the Snowy Peaks of Kilimandjaro. 4. Letters from M. du Chaillu and Baron von der Decken.

TUES. ...Civil Engineers, 8. Mr. G. O. Mann, "On the Decay o Materials in Tropical Climates, and the methods for arresting and preventing it."

Statistical, 8. Mr. E. T. Blakeley, "On the Commercial Progress of the Colonies, 1858 to 1863."

Anthropological, 8.

WED. ...Society of Arts, 8. Opening Address by Wm. Hawes, F.G.S., Chairman of the Council.

THURS...Linnæan, 8. 1. Mr. Blackwall, "On the Movements of Insects over Polished Surfaces." 2. Dr. Shortt, "On a huge Banyan Tree in the Chingleput district."

Chemical, 8. Dr. Marcet, "On the Brine of Salt Meat." Professor Wanklyn, "On the Nature of the Compound Ethers."

Patents.

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From Commissioners of Patents Journal, November 4th.

GRANTS OF PROVISIONAL PROTECTION.

Blasting, safety fusees for—2566—W. E. Newton.
Boots, &c., cutting out and pricking the soles and heels of—2637—H. E. Craven and T. Carrack.
Bricks, tiles, &c., manufacture of—2627—S. S. Anderson.
Carriages—2572—J. Macdonald.
Cartridges—2623—W. Richards.
Cases and frames, printers' composing—2619—W. O. Walbrook.
Casks, &c., emptying the contents of—2641—E. H. Taylor.
Centrifugal machinery, applicable to pumps, &c.—2603—J. E. A. Gwynne.
Coals, &c., machinery employed in getting—2613—J. G. Jones.
Compasses—2459—E. V. F. Huntzinger, jun.
Corns, bunions, &c., eradication of—2553—T. Randle.
Cotton-pressing machinery—2462—H. Nelson.
Fabrics, composition for finishing or renovating—2576—J. Johnson.
Fibrous substances, preparing—2649—J. Hall, W. Dunkerley, and S. Schofield.
Fire-arms, breech-loading—2609—S. Westwood and H. Broadhurst.
Fire-arms, caps for—2324—F. L. M. Dorvault.
Fire-arms, conversion of muzzle-loading into breech-loaders—2458—T. Turner, jun.
Fire-places—2643—E. B. Wilson.
Fringes, manufacture of—2657—J. Walmsley and N. G. Pitman.
Furnaces and crucibles—2318—T. A. Rochussen.
Garments, means of attaching buttons to—2631—J. W. Scott.
Guns, breech-loading—2585—T. Turner, jun.
Ink bottles, fasteners for pocket—2531—J. Cooke.
Jute, &c., preparation of—2505—H. L. Kolzewsky and A. Wilson.
Knives, hafts or handles for spring—2580—W. and F. W. Gilbert.
Magneto-electric machines—2486—C. H. Collette.
Metal cornice, &c., manufacture of—2611—T. Allcock.
Metal sheets, corrugating, fluting, or fashioning—2574—C. Pettit.
Mirrors, ovens employed in the manufacture of—2448—J. H. Johnson.
Motive power—2451—B. J'A. Bromwich.
Oils, apparatus for distilling—2653—J. Nimmo.
Oils, extracting from bituminous substances—2105—C. G. Lundborg
Projectiles—2587—J. P. Harriss.
Pumps, construction of—2633—H. Bateman and E. G. Garrard.
Purses, cigar-cases, &c.—2651—F. Jenner.
Railway trains, signalling on—2280—J. Adams.
Reaping and mowing machines—2615—R. Hornsby.
Rotary engine—2629—G. Schorb.
Sail-cloth, threads and yarns employed in the manufacture of—2402—G. H. Harrington, and H. and F. Y. Hewetson.
Sails, reefing and furling—2568—S. Howard and W. Wood.
Sheep's wool, preparation of, for medical purposes—2583—W. Buxton.
Ships' bottoms, preventing the fouling of—2645—J. Dannatt.
Ships, propellers for—2488—S. Vaile.
Silk, twisted—2424—W. Clark.
Steam-cultivation—2466—W. Steevens.
Stays and bodices, covering busks for—2584—G. Hartley.
Theatres, producing optical illusions in—2564—J. Maurice.
Tubular boilers, preventing leakage in—2444—C. H. Reid.
Yarns, washing—2251—A. Wever.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Fish hooks, manufacture of—2688—C. O. Crosby.

PATENTS SEALED.

945. A. Normandy.
1120. J. McDowell.
1135. H. H. Henson.
1140. W. Simpson.
1142. J. J. Miller, jun.
1147. J. Turnbull.
1148. W. Hirst.
1149. A. Rieder.
1150. C. P. Stewart and J. Gresham.
1152. A. Swonnell.
1155. J. H. Johnson.
1156. J. H. Johnson.
1158. J. Wavish.
1159. J. Cameron.
1165. E. Heywood.
1166. H. Woodward.
1167. E. Tombs.
1176. G. Pulsford & G. Walkland.
1180. T. W. and R. Condron, and G. R. Hartshorne.
1181. J. A. Wanklyn.
1193. W. Weild.
1196. T. M. Gisborne.
1198. R. Wilson.
1210. R. F. Fairlie.
1224. B. Gyte and M. Walsh.
1257. A. B. Childs.
1261. G. Homfray.
1300. G. Shaw.
1384. W. E. Newton.
1474. W. E. Newton.
1480. F. A. E. G. de Massas.
1752. C. Claxton.
1860. J. P. Ravard.
1913. H. Carter.
2088. A. A. L. P. Cochrane.

From Commissioners of Patents Journal, November 8th.

PATENTS SEALED.

1170. J. Chambers.
1182. S. Dreyfous.
1184. J. Rowland.
1185. M. Morgans.
1192. J. Brown and A. P. Price.
1194. J., J. and J. Booth.
1203. W. Horne.
1204. J. L. Norton.
1205. T. N. Kirkham and V. F. Ensom.
1208. R. D. Dwyer.
1209. J. Dodgeon, J. Gaukroger and W. Shackleton.
1211. E. Myers & T. G. Progers.
1216. G. Haseltine.
1218. D. Bateman.
1222. R. Griffiths.
1225. P. Craven.
1230. R. Jones.
1270. J., E. G. and C. H. Freeman.
1271. H. Defries.
1277. W. Tasker, jun.
1323. J. B. Fuller.
1342. W. E. Newton.
1614. C. J. Tinker.
1912. H. Attwood.
2059. B. Burton.
2149. H. Bennison.
2213. D. Brodie.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2745. M. and M. Myers, and W. Hill.
2777. R. Fethney.
2810. A. B. Berard.
2772. R. Wilson.
2798. H. G. Gibson.
2799. J. Hancock.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

2802. C. E. Amos.
2803. C. Clay.
2814. H. R. Palmer.
2824. J. Adams.

LIST OF PRESENTS.

The following Presents have been made to the Society during the past year. The thanks of the Society have been forwarded to the donors:—

Presents.	Donors.
Specifications of Patents up to the present time, and Indexes	Commissioners of Patents.
Abridgments of ditto	"
Commissioners of Patents' Journal.	"
Journal of the Society for the Encouragement of Manufactures at Munich, 1851–62	Society.
Official Austrian Report on the International Exhibition of 1862	Austrian Ministry of Commerce.
Hand-book of Average, by Manley Hopkins	Author.
Twenty-seventh Annual Report of the Art Union of London	Art-Union.
Journal of the West of England Society of Agriculture for 1863	Society.
Memoirs of the Royal Astronomical Society, Vol. xxxi., 1861–62	"
Antiquities found on the sea coast of Cheshire. Rev. A. Hume, LL.D., D.C.L.	Author.
Report on the International Exhibition of 1862, by J. W. Del Campo	"
Spargo's Statistics and Observations on the Mines of Cornwall and Devon, 1864.	"
The Science of Vision, by Arthur Parsey	Samuel Parsey.
Illustrated Catalogue of the Brett Collection	Jacob Brett.
The Exhibited Machinery of 1862, by D. K. Clark, C.E.	Author.
Rudimentary Treatise on Cottage Building, by C. Bruce Allen, Architect	"
Reports of the Royal Society of Tasmania, 1859–60	Dr. Milligan.
Report of the Inspectors of Factories for the half-year ending 31st Oct., 1863	Alex. Redgrave.
Statistics of New Zealand for 1862...	Colonial Secretary.
" The Colony of Victoria for 1862	"
Another Blow for Life, by George Godwin, F.R.S.	Author.
Rapport de l'Administration de la Commission Impériale sur la Section Française de l'Exposition Universelle de 1862	The Commission.
Tables for comparing British with Metre Weights, and Measures and Weights, by C. H. Dowling	Author.
Additions to the British Museum Manuscripts, 1846–7	Trustees.
United States' Patent Office Report, 1861	Commissioner of Patents for U.S.
Introductory " " "	"
Australian Building Stones, by J. G. Knight, F.R.I.B.A.	Author.
Catalogues, &c., of the Italian Cotton Exhibition, held at Turin	Commendatore Devincenzi.
Memoirs of the Geological Survey of India (Palæontologica Indica), part 3, 2–5	Geological Survey.
Smithsonian Contributions to Knowledge, Vol. xiii.	Smithsonian Institution.
——— Miscellaneous Collections, Vol. v.	"
——— Catalogue of Minerals	"
——— Report, 1860	"
——— 1862	"
Proceedings of the American Philosophical Society, Philadelphia, Vol. ix., No. 70	Society.
Thirty-eighth Annual Report of the President of Harvard College, 1862–63	Harvard University.
Catalogus Universitatis Harvardianæ, 1863	"
Report of the British Association for the Advancement of Science (Newcastle-upon-Tyne), 1863	Association.
The New Process of the Preservation of Meat for Food, by J. Morgan...	Author.
Military, Medical, and Surgical Essays, prepared for the United States Sanitary Commission, Edited by W. A. Hammond, M.D., United States Army	United States Sanitary Commission.
A Succinct Account of the Works and Purposes of the Sanitary Commission of the United States Army	"
Report on the Plains and Rivers of Canterbury, New Zealand, by W. T. Doyne, C.E.	Author.
Proceedings of the Royal Society...	Society.
Proceedings of the Royal Geographical Society	"
Proceedings of the Linnæan Society	"

PRESENTS.	DONORS.
Proceedings of the Société des Sciences Naturelles de Grand Duché de Luxembourg, 1864......	Society.
Proceedings of the Society of Antiquaries	Society.
Proceedings of the Royal Institution of British Architects..................	Institute.
Proceedings of the Institution of Mechanical Engineers, 1864	Institution.
American Journal of Science and Art	Messrs. Silliman and Dana.
Canadian Journal of Industry, Science, and Art	Toronto Canadian Institute.
Journal of the Royal Agricultural Society, 1864	,,
Dictionary of Chemistry, by Henry Watts, B.A. (in continuation).	Messrs. Longman and Co.

PRESENTS.	DONORS.
Transactions of the Institute of British Architects, 1862-63	Institute.
Transactions of the Institution of Naval Architects, 1862 and 63 ...	Smithsonian Institution.
Transactions of the Historic Society of Lancashire and Cheshire, Vol. xv., 1862-3	Society.
Transactions of the Linnæan Society	Society.
,, ,, Zoological Society	,,
Journal of the Royal Geographical Society, 1863..........................	Society.
Annales de la Société Libre des Beaux-Arts	,,
Journal of the Royal Asiatic Society, 1864	,,
Jones's Essentials of Spelling.........	Author.

CONTRIBUTIONS TO THE READING ROOM.

The Council beg to acknowledge, with thanks to the Proprietors, the regular receipt of the following Journals and Periodicals:—

WEEKLY.

Agricultural Review.
Athenæum.
British Journal of Photography.
Builder.
Building News.
Chemical News.
Cosmos.
Engineer.
Gardeners' Chronicle.
Les Mondes.
London Review.
Mechanics' Magazine.
Mining Journal.
North British Agriculturist.
Photographic News.
Reader.
Social Science Review.

FORTNIGHTLY.

Canadian News.
Cotton Supply Reporter.

MONTHLY.

Artizan.
Art Student.
Bulletin de la Société d'Encouragement pour l'Industrie Nationale.
Bulletin du Musée de l'Industrie.
Canadian Naturalist and Geologist.
Civil Engineer and Architects' Journal.
Educational Times.
Engineers' Journal (Calcutta).
Intellectual Observer.
Journal of the Board of Arts and Manufactures for Upper Canada.
Journal of the Chemical Society.
Journal of the Franklin Institute.
Journal of the Horticultural Society.
Journal of the National Life Boat Institution.
Journal of the Pharmaceutical Society.
London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science.
Mining and Smelting Magazine.
Newton's London Journal of the Arts and Sciences.
Photographic Journal.
Practical Mechanics' Journal.
Presse Scientifique des Deux Mondes.
Revue du monde Colonial.
Technologist.
The Horological Journal.
The Institute and Lecturers' Gazette.
Veterinarian.

QUARTERLY.

Fine Arts Review.
Journal of Mental Science.
Journal of the Geological Society.
Journal of the Royal Dublin Society.
Journal of the Royal United Service Institution.
Journal of Science.
Journal of the Statistical Society.
Popular Science Review.

ERRATA.

Page 114, col. 2, line 5 from bottom, for "flax" read "wool."
,, 318, col. 1, line 6, of Dr. Marcet's speech, for "less carbonic acid" read "more carbonic acid."
,, 569, col. 1, line 9, for "of its professors" read "to its professors;" and line 25, for "but the artists having" read "the artists not having."
Page 620, paragraph 6, for "31st February" read "28th February."
,, 687, col. 2, line 10 from bottom, before "essayist" omit "young."
,, 688, col. 2, line 37, for "Parois" read "Pavis."